SELF-REGULATED LEARNING STRATEGIES PRACTICED BY STUDENTS STUDYING FOR G.C.E O/L

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Abstract

The percentage of students passing mathematics and science in G.C.E O/L has been low over the past years. Among many reasons for students to fail, lack of the practice of self-regulated learning strategies is one of the reasons. Hence, this study aimed to identify various forms of self-regulatory learning (SRL) strategies practiced by students studying for O/L examination and to investigate the factors that would facilitate self–regulated learning strategies relating to student academic achievement. The study adopted an explanatory sequential design. The participants of the study were 440 grade 11 students from the Colombo zone. Academic achievement was measured by the scores of mathematics and science in the 3rd term exam and calculating the Z- scores out of it. The students with a positive Z- score were labelled as high achievers and the students with a negative Z- score were labelled as low achievers. The Motivated Strategies for Learning questionnaire was used to find out the students' self-regulated learning strategies, and the self-developed questionnaire was used to investigate the factors that facilitate SRL. Further, focus group interviews for students and semi-structured interviews for teachers were used to triangulate data. Data were analyzed quantitatively using tables and charts from SPSS and qualitatively using content analysis. The findings revealed that the Self – regulated learning strategies that were mostly practiced by students were rehearsal, elaboration, organization, critical thinking meta-cognition, time and environment management, effort regulation, peer learning and help-seeking strategies. According to this finding, it is clear that all 9 strategies were practiced by high achievers but it is important to note that critical thinking was the strategy barely practiced by the students. Low achievers have practiced only five out of the nine self-regulated learning strategies. The study found that goal setting and employment perspective, motivation, and seeking help from teachers and parents are factors that facilitate self-regulated learning.

Keywords: self-regulated learning (SRL), strategies, academic achievement

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INTRODUCTION

Self-regulated learning relates to how individuals manage their personal learning process, especially how to monitor, regulate and evaluate their own learning actions and behavioural process that increase the likelihood of goal attainment (Zimmerman, 2015). During the past years, the achievement level of the G.C.E O/L examination for mathematics and science are relatively low compared to the other subjects. In 2019, the percentage of students who passed mathematics was 55.18%, and Science was 68.02 % (National Evaluation & Testing Service, 2019). The government implements many strategies such as conducting free seminars for slow learners, and providing free mock exams and model question papers to minimize the fail rate; however, the number of failures is a burning issue in the education system. Evidence from the literature suggests a number of reasons for the failures. Literature reveals lack of food and clothing, poor attendance, financial issues of parents, migrant parents, separation of parents and unavailability of qualified and experienced teachers as some reasons for failures (Arunathileke, 2005, Gunawardene 2009). Wijethunga & Chandrasena (2019), revealed that the reasons for students fail in mathematics and science in Sri Lanka are due to lack of students' interest in mathematics, the inability of the teachers to explain certain concepts clearly, less attention paid to weak students, lack of motivation in students, limited time, a higher number of students in a classroom, and lack of regular inspection programmes as reasons for failures. Out of the six reasons mentioned above, most of the reasons blame the teacher as a reason for students to fail. However, lack of interest and lack of motivation can be the main reason for failure. This is because when the students are not interested in learning, they may not self-regulate or monitor their learning. Hence, the number of failures might be high. The above reasons that were found from previous studies provide an assumption that lack of practices of self-regulated learning strategies may be the reason for failure as most of the reasons found for students to fail in mathematics and science are related to self-regulated learning strategies and the factors influencing self-regulated learning. Therefore, the study aimed in finding out the self-

regulated learning strategies practiced by students studying for G.C.E O/L and the factors that facilitate self-regulated learning.

METHODOLOGY

The present study adopted the mixed method research approach as it collects and analyses both quantitative and qualitative data. Under the mixed method research approach, the explanatory sequential design was adopted in the present study as it was the best fit to answer the proposed research questions and draw on broader conclusions of findings. The population of this study was all the students in grade 11 classes in the Colombo Zone. Colombo Education Zone was considered as it was one of the best-performing zones and the researcher needed an accessible sample to conduct focus group interviews for students and interviews for teachers. A representative sample of the population was selected by following the stratified random sampling method. A total of 440 students from 30 schools were selected as the student sample and 30 teachers, 1 math or science teacher from each school, were selected as the teachers' sample of the study.

Motivated strategies for learning questionnaire was used as the primary data collecting instruments along with the self-developed questionnaire, focus group interview schedules and semi-structured interview schedules. The validity of the questionnaire was checked through piloting the questionnaire to 30 students. No changes were made in the English and Sinhala versions of the questionnaire after piloting as participants mentioned everything was clear. A few changes were made in the Tamil version as it was translated for the first time by the researcher following the procedures of world health organization (2014).

Quantitative data were analyzed using SPSS version 2.3. Percentile values, chi-square analysis, and co-relation co-efficient tests were done to analyze data while qualitative data was analyzed using content analysis

RESULTS AND DISCUSSIONS

Through the correlation coefficient test, percentile and mean values, the study was able to find the self–regulated learning strategies that were highly practiced by students. The strategies were a rehearsal, elaboration, organization, critical thinking meta-cognition, time and environment management, effort regulation, peer learning and help-seeking strategies.

The below table indicates the relationship between academic achievement and the mean values of each strategy.

Table 1

The Relationship between Academic Achievement and Self-Regulated Learning Strategies

		Mean values	Academic achievement
Rehearsal	Pearson Correlation	1	.528[**]
	Sig. (2-tailed)		.000
Elaboration	Pearson Correlation	1	.632[**]
	Sig. (2-tailed)		.000
Organization	Pearson Correlation	1	.386[**]
	Sig. (2-tailed)		.000
Critical thinking	Pearson Correlation	1	.279[**]
	Sig. (2-tailed)		.000
Metacognitive knowledge	Pearson Correlation	1	.661[**]
	Sig. (2-tailed)		.000
Time & environment	Pearson Correlation	1	.485[**]
	Sig. (2-tailed)		.000
Effort regulation	Pearson Correlation	1	.679[**]
	Sig. (2-tailed)		.000
Peer Learning	Pearson Correlation	1	.094[*]
	Sig. (2-tailed)		.048
Help seeking	Pearson Correlation	1	.355[**]
	Sig. (2-tailed)		.000

Note. correlation is significant at the 0.01 level (2 -tailed)
Note. correlation is significant at the 0.05 level (2-tailed)

As table 1, illustrates there is a significant relationship between the mean values of each strategy and the academic achievement of the students. Eight strategies namely rehearsal, elaboration, organization, critical thinking, metacognitive knowledge awareness, time and environment management, effort regulation and help-seeking strategies have a significant relationship with the academic achievement of the students. If the alpha value is greater than the p-value then there is a significant relationship (Samuels, 2014). The alpha value is 0.01 and the p-value for the above-mentioned strategies

is .000. (P < 0.01). Peer learning strategy has a significant relationship with academic achievement as the alpha value is 0.05 and the p–value is .048. It can be concluded that all 9 strategies were practiced by high achievers but it is important to note that critical thinking was the strategy barely practiced by the students. However, the average mean value for all of the above-mentioned strategies was higher for high achievers in contrast to low achievers. The below table indicates the mean values for each strategy for high and low achievers.

Table 2

Mean values of high and low achievers

Strategy	Mean value of high achiever	Mean value of low achiever
Rehearsal	4.07	2.94
Elaboration	3.94	2.35
Organization	3.88	3.14
Critical thinking	3.58	3.14
Meta-cognitive knowledge	4.02	2.74
Time & environment	4.16	3.53
Effort regulation	4.15	2.92
Peer learning	3.80	3.62
Help-Seeking	4.03	3.79

According to the manual of MSLQ if the mean value is less than three, then the practice of the strategy is unsatisfactory. Hence, based on the analysis it is clear that low achievers have practiced only five out of the nine self-regulated learning strategies. This was further proven through the focus group interview that the high achievers practiced cognitive and metacognitive strategies such as paraphrasing, summarizing, creating analogies, highlighting, note-taking, organizing information, reviewing test

papers, reviewing notes, memorizing and recalling information. Table 3 indicates some of the extracts from students.

Table 3

Extracts from the Focus Group Interview

Cognitive strategies	Extracts from the interview
Making Short notes	'I take short notes and use concept maps. This helps a lot.' (H-7).
	'For science taking short notes helps and doing lots of sums helps to practice math.' (L-3)
Elaboration	'Relating it to something interesting or funny. I always relate the extra information I get from my tuition classes with my school notes.' (H-3)
Organization	'I use highlighters. I underline the important facts. I write my own notes' (H-2)
	'I summarize, use highlighters to highlight important points and take notes' (L – 8)
Rehearsal	'I repeat items to myself. I guess writing short notes helps me a lot. Practicing the sums helps to get good marks in math.' (H -4)
	'I repeatedly say the same thing to myself until I am able to write it correctly. Drawing tables also helps to remember.' (H-6)
	'No techniques but I just say it again and again.' (L-3)
	'I repeat it 10 times or more to memorize something.' (L-4)
Summarizing	'Summarizing. I use tables and write it to remember stuff' (H-8)
	'I underline the important facts. I write my own notes. Summarizing the text into my own words

	helps in remembering.' (H -2)
	'Summarizing and connecting it with general ideas. I do practice sums' (L-6)
Metacognitive strategies	There are lot of science experiment videos that are done in foreign countries. I stop reading and I watch the video. It helps' (H – 1)
	'I try another way or I change my seating place.' (H – 2)
	'I read it again and I will never give up. I somehow try my level best to understand it.' (H – 3)
	'I feel tired. So, I just skip it.' (L – 4)

The second objective was to find out the factors that facilitate self-regulated learning strategies. Twenty hypotheses under four main factors were developed. The four main factors were: goal setting and employment perspective, self-efficacy, motivation, and seeking assistance.

Table 3

The Association between Factors and Academic Achievement

Factor	Degree of freedom	Asymptotic significance (2 sided)	Cramer's V
Goal setting	2	.000	.194
Self-efficacy	1	1.000	.000
Motivation	1	.000	.255
Seeking assistance	1	.312	.048

There were five items related to goal setting and employment perspective. Out of the five items of the goal setting, 3 items had a significant association with academic achievement. They are the association between future ambition, expected O/L results and the type of job and academic achievement. All three items related to self–efficacy didn't have a significant association. There were five items related to the motivation factor. All 5 items: the association between the purpose of learning, learning challenging items, preference to get the highest marks in all subjects, positive reinforcement and negative reinforcement and academic achievement had a significant association. Hence, the study concludes that motivation is a factor that influences self–regulated learning.

Out of the seven items of the help-seeking factor, five items had a significant association with academic achievement. Therefore, the study concludes that seeking help from parents, seeking help from teachers, receiving guidance from teachers, parents' supervision and monitoring at home and attending workshops related to self-regulated learning as factors that influence self–regulated learning strategies. The study doesn't reject the null hypothesis of seeking help from friends and helping each other and academic achievement.

During the interview with 30 teachers, they were asked about the factors influencing self-regulated learning. The below figure summarizes what the teachers thought as factors influencing SRL

Figure 1

Factors Influencing Self-Regulated Learning

Factors influencing SRL
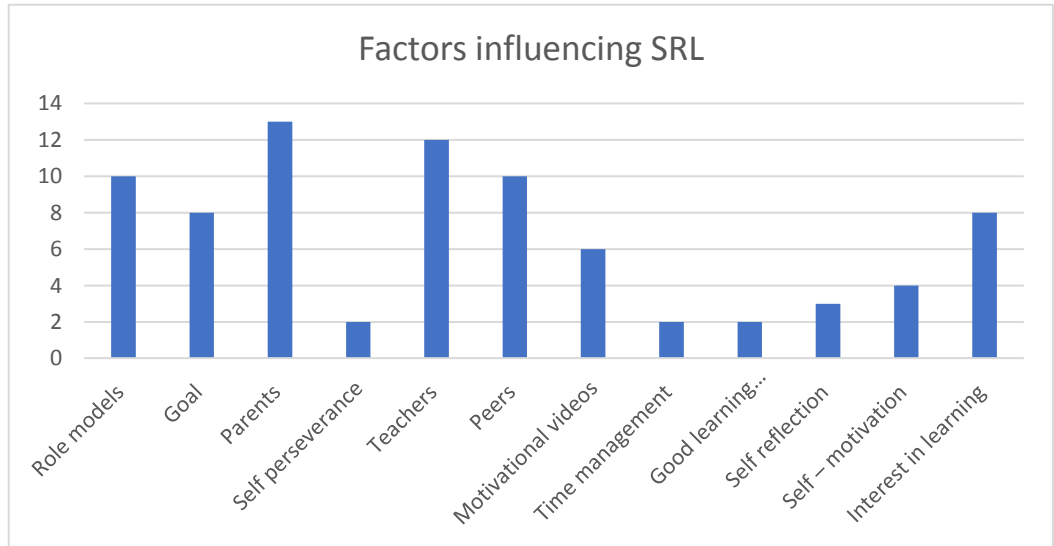
The study concludes that goals, self-efficacy, motivation, support from peers, parents, and teacher, a good learning environment, and interest in learning as factors influencing SRL.

CONCLUSIONS /RECOMMENDATIONS

The finding of the study was similar to what previous literature revealed. Self-regulated learners rehearse, elaborate, organize, self-monitor, and self-evaluate at various points during the process of acquisition (Corno, 1986, 1989; Ghatala, 1990; Pressley, Borkowski, OE Schneider, 1987). Further, the study concluded that there is a significant association between factors that facilitate self-regulated learning and academic achievement as the study was able to reject the null hypothesis of 13 out of the 20 items.

Self–regulated learning strategies play a major role in students' achievement. Hence, it is of utmost importance that the students are trained to use such strategies by teaching them implicitly as well as explicitly. Further, teachers should be provided training on how to teach them to students.

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